DRAFT GUIDELINES

FOR THE PREPARATION OF

AN ENVIRONMENTAL IMPACT STATEMENT

ON AIR TRANSPORTATION PROPOSALS FOR THE TORONTO AREA

Issued by:

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1. INTRODUCTION

This document prepared by the Environmental Assessment Panel reviewing air transportation proposals in the Toronto area, contains the draft guidelines for the preparation of an Environmental Impact Statement (EIS). The responsibility for preparing the EIS lies with the proponent, Transport Canada. The Guidelines identify the priority issues and concerns which the Panel has determined should be addressed.

Transport Canada has proposed a two-stage plan to relieve air traffic congestion in the Toronto area. The first stage of the plan, the addition of two runways at Lester B. Pearson International Airport (LBPIA), is proposed as a medium-term solution. The second stage of the plan will contain proposals to serve aviation in the Toronto area in the long term.

The Environmental Assessment and Review Process (EARP) of the Government of Canada requires that proposed projects that are likely to have significant adverse environmental effects be submitted for public review to an Environmental Assessment Panel appointed by the Minister of the Environment. In November, 1989, a Panel was appointed to undertake this review.

There are four opportunities for public involvement in the environmental assessment review process:

* with the Panel during Scoping Sessions leading up to preparation of these draft guidelines for the Environmental Impact Statement (EIS);

* with the Panel during the review of these draft guidelines;

* with Transport Canada, the initiating department for this project, during its preparation of the EIS; and,

* during Public Hearings held by the Panel as part of the review of the EIS.

The Panel prepared these draft guidelines after holding six days of scoping meetings in April during which 104 oral presentations were made. It also received an additional 86 written submissions. This input served as a basis for the development of the draft Guidelines for the EIS. The public will have a 30 day review period in which to submit any written comments on the draft guidelines. All comments received will be considered by the Panel and made public. The Panel will then finalize the draft guidelines and transmit them to Transport Canada for preparation of the EIS. These guidelines are intended to provide general guidance and instruction to Transport Canada, the initiating department, in its preparation of the EIS for the proposal of two additional runways. When completed the EIS will be reviewed by the Panel. When the Panel is satisfied that the EIS responds adequately to the

Guidelines, the Panel will hold Public Hearings. At the Public Hearings, all interested parties will have an opportunity to present their views to the Panel on the environmental and socio-economic aspects of the proposal. Transport Canada representatives will be present at the Public Hearings to answer questions pertaining to subjects addressed in its EIS.

Following the Public Hearings the Panel will present its recommendations concerning the medium-term proposal in a report to the federal Ministers of the Environment and Transport. The Minister of Transport, after discussion with the Minister of the Environment, will then decide if the project should proceed and, if so, under what conditions.

A similar process will then be followed to review Transport Canada's long-term proposals.

The EIS for the proposed additional runways at LBPIA should contain the information described in the following sections of these draft Guidelines.

2. SUMMARY

The EIS should begin with a summary of the document and its findings. The summary should allow the reader to obtain a concise idea of the contents of the EIS and to focus on items of specific interest. It should be understandable to the public and lend itself to easy use by those requiring a rapid appraisal of the proposed project.

The summary should also describe the process that led to the referral of Transport Canada's proposals for air transportation in the Toronto area to the Minister of Environment.

Information presented in the summary should include:

- current procedures and air traffic problems encountered at LBPIA;
- a description of the need for the project together with the supporting rationale and the financial costs and benefits to airport users, local communities, the province, the region and the country;
- future air travel and matching air facility requirements, both civil and commercial; and,
- a concise evaluation of the alternatives considered;

- a brief description of the selected project proposal (i.e., the additional runways) and the location for which it is proposed;
- a concise summary of the major environmental conditions in the area which may affect or be affected by the project;
- a description of the environmental and socio-economic impacts, the mitigation measures to be implemented, and the significance of any residual effects;
- a brief description of the methodology used to assess the impacts, in particular the major assumptions that influenced the organization of the study;
- a description of any limitations on the EIS created by information deficiencies; and,
- a listing of the study team that prepared the study.

The EIS summary should be included as part of the EIS. It should be prepared for wide distribution by the initiator as a document separable from the EIS itself. A sufficient number of copies should be produced for agency and public use. The number of copies required shall depend upon anticipated demand and shall be determined at the time of publication.

3. PROJECT SETTING

3.1 Historical Setting

The EIS should include a review of previous Transport Canada policies and the findings of the Gibson Airport Inquiry concerning the expansion of LBPIA and the development of other airports in the Southern Ontario region. In addition, the EIS should contain an explanation of how and why the conditions and policies that have previously led Transport Canada to reject the suggestion of building additional runways at LBPIA have changed to the point where the proposal for two new runways is now preferred.

3.2 Aviation Setting

The precise location of LBPIA should be described relative to its neighbouring urban development, the communities it serves, local and regional ground transportation facilities, other airports in Southern Ontario, and the structure of its surrounding airspace. Maps, air photos and other descriptive means should be used as

necessary.

Describe the different modes of transportation used by passengers, meeters and greeters, employees and others to access the airport. Describe the methods by which supplies and air cargo are brought to the airport, and cargo and garbage are removed.

The EIS should include a brief description of the development of the LBPIA facility from site selection in 1937 to its existing configuration.

Similarly, the development of air traffic at LBPIA, as measured in terms of passengers, cargo and aircraft movements, should be described. Scheduled airline, charter, cargo and general aviation movements should be reported separately. Data presented for current air traffic at LBPIA should include:

- the typical distribution of flight arrivals and departures throughout the day;
- the typical distribution of flight arrivals and departures throughout the week;
- the nature of the shifts in these typical distributions that occur during peak travel periods; and
- the typical distribution of runway utilization for arrivals and departures by month, together with an indication of how runway utilization changed in May 1988 with the introduction of simultaneous independent parallel runway operations.

Significant factors, not directly related to the demand for air services, that influence the current air traffic levels at LBPIA should be explained, including:

- the actual and desired air traffic controller staffing levels and their relationship to the flow of aircraft to and from LBPIA, (together with a description of the procedures followed to provide air traffic safety and control during periods of under-staffing); and,
- the typical weather (wind direction, ceiling and horizontal visibility) conditions encountered at LBPIA, by season, and how these conditions have influenced LBPIA usage.

Transport Canada policies and procedures that may influence the development of air traffic at LBPIA should also be described.

4. PROJECT NEED

4.1 Demand For Aviation Services

Given the present aviation congestion problems in the Toronto area the description of demand for the project in the EIS should begin with an analysis of present and future demand for air travel in the several markets served by Toronto area airports. This should include:

- a specific review of anticipated business and consumer demand for travel from residents of the greater Toronto area, showing how growth in the region's demand will or will not exceed the rate of growth in demand of the country as a whole;

- a breakdown of demand forecasts for specific passenger and cargo markets served by LBPIA and other regional airports, including within Ontario, within Canada, transborder, Europe, and the Pacific Rim and other international markets; and,

- an examination of current and projected demand to and from the regional communities that use LBPIA as their "hub" airport. These communities include Windsor, London, Kingston, Ottawa, North Bay, Sault Ste. Marie, Sudbury, Thunder Bay, Dryden, Timmins, Sarnia, and communities in the Northern United States.

This analysis should include projections and assessments related to demographics, economic conditions, changes in business practices, the effects of increased continental and global competition, and the growing size and economic importance of the recreation and tourism industries.

The demand for travel by air should then be translated into the demand for actual aircraft movements at each Toronto area airport. This demand estimate should be "unconstrained", in the sense that it reflects the total demand for air service at each airport in the absence of movement caps or other controls on the provision of aviation services.

As part of this process, the EIS should include:

- an explanation of the process and assumptions used to convert passenger and cargo travel demand into aircraft movements;

- assumptions used to determine the peaking of aircraft movements during the day and week;
- a breakdown between movements for international traffic under bilateral agreements, transborder traffic, domestic traffic, traffic to / from regional spoke communities, charter traffic, general aviation, and cargo; and
- a statement of policies used to allocate aircraft movement demand to each airport.

Specific demand estimates should be made for specific future years. The years selected should be those that bound the medium- and long-term time periods as defined by Transport Canada in its proposal for additional runways at LBPIA and in its planning processes.

Consideration should be given to the impact on the demand for aircraft movement at LBPIA of different airline operating strategies, including the use of a "hub and spoke" feeder system, the use of markedly different aircraft fleets to serve smaller communities, the emphasis on carrying cargo in the bellies of passenger aircraft, the substitution of connections at LBPIA for non-stop flights between medium-sized centres, and airline use of other Toronto area airports for commercial, charter, cargo and general aviation flights.

An analysis of the effects on the total demand and the distribution of demand throughout the day and week at LBPIA of the introduction of "peak period" pricing, as proposed by Transport Canada, should be included in the analysis of demand for aircraft movement at LBPIA.

In presenting demand projections for air transport, the proponent should also present the reasons for that demand. In this regard, the EIS should show clearly the linkages between demand and the expanding social and economic needs of the region, the province, and the country.

The travel demand and aircraft movement estimates upon which the need for the project is based should be compared to the various demand estimates for air travel and aircraft operations at LBPIA prepared and published since 1968, when the question of the addition of runways of LBPIA first entered the public arena. The reasons for similarities or differences in the various estimates should be explained.

The EIS should examine how the development and use of other modes of transportation could change the projected demand for aviation services at Toronto area airports. Having established estimates of the level of demand for air services in the Toronto area, the

EIS should address the potential impact on this demand for air travel on other projects currently under public discussion, such as a Montreal-Toronto high speed rail link.

The methodology used to prepare the demand estimates should be clearly identified, and the validity of each assumption used in the demand forecast should be discussed. The potential effects of changes in the assumptions should be quantified.

4.2 Airport Capacity

The capacity of the existing airspace surrounding LBPIA, and the runways, taxiway system, apron and ramp areas and the terminals must be established in the EIS. In addition, the capacity of those same systems with the proposed runways added must be established. The assumptions and methodology used to calculate capacity must be provided, particularly the extent to which improved productivity procedures are assumed in the calculations.

The EIS should also draw conclusions about the effects of the productivity improvement measures taken to date and those planned for the immediate future at LBPIA. It should demonstrate the extent to which productivity improvements can respond to the demands being placed on the airport. In particular, the EIS should draw conclusions about the extent and timing of productivity improvements as a result of having a full complement of air traffic controllers at LBPIA and the Toronto Centre, together with the planned introduction of air navigation and air traffic control equipment.

Capacity increases resulting from the addition of new runways must be calculated on an incremental basis, i.e., runway by runway. Transport Canada should also investigate and discuss the methods used by other major international airports of similar configuration, which serve similar traffic demands, or which utilize independent parallel runway systems to calculate and achieve their operational capacities. This should include an evaluation of innovative schemes such as those used to handle turbo-prop aircraft, and to permit simultaneous use of intersecting runways.

4.3 Project Need: Demand / Capacity Comparison

The need for the project should be established on the basis of comparisons between the unconstrained demand for aviation services in the Toronto area and the capacity of the present facilities at LBPIA and other area airports. The comparison should document the magnitude of the current capacity shortfall and the relationship between future demand and the capacity of LBPIA with the proposed new runways. This relationship must be reviewed in terms of a

comparison between timelines for the development of demand up to and beyond the point of opening of the proposed runways, and the increases in capacity that would result from the new runways and other measures to be taken at LBPIA. Any capacity shortfalls or surpluses should be identified.

5. ALTERNATIVES

5.1 Basic Characteristics of Project and Alternatives

The EIS should contain an examination of the basic characteristics of the proposed project and all of the reasonable alternatives. This examination should include, for the project and each alternative, a description, as well as information on environmental impacts, socio-economic impacts, monitoring, mitigation and compensation measures and safety.

In weighing options to the proposed project in the EIS, Transport Canada should closely examine the following alternatives:

a) Improvements in the productivity achieved with the existing LBPIA 3-runway configuration by various means, including:

- new taxiway systems and taxiing procedures;
- revised runway use and operational procedures;
- improved air traffic control operational procedures;
- increased air traffic controller complement;
- improved air traffic control equipment;
- expanded terminal airspace; and,
- adjustments in aircraft mix and the management of aircraft mix.

b) Diversion of specific air traffic, and further development of parallel air services from LBPIA to other regional airports, improved as necessary to serve the diverted traffic. This may include the expansion or development of other airports' facilities in lieu of expansion at LBPIA, and may further include the provision of ground transportation links between regional airports.

c) Addition of only one runway at LBPIA. More than one single-runway option may have to be studied.

d) Development or construction of a second major airport to serve the Toronto region in conjunction with LBPIA.

e) Development or construction of a new major airport to replace LBPIA.

f) A combination of some or all of the above alternatives.

5.2 Analysis and Comparison of Alternatives

Each alternative should be compared with LBPIA including the two additional proposed runways in terms of its implementation timing, the relationship between its implementation timing and its ability to meet air traffic demands in the region, and its compatibility with future plans for aviation services in the Southern Ontario region.

A structured comparison of all of the costs and all of the benefits of the proposed project, in comparison with those of the alternatives, should be provided. The costs and benefits considered in this analysis should include both those quantifiable in terms of dollars and those not quantifiable in terms of dollars, or any other units. The assessment of the proposed project and each alternative should include an analysis of all direct and indirect environmental, social and economic impacts.

On the basis of the examination and comparison described above, the EIS should identify alternatives that have the potential to satisfy the air traffic congestion problems in the Toronto area.

The information described in sections 6 to 11, inclusive, of these Draft Guidelines should be developed to the same level of detail for Transport Canada's proposed project and any other alternative found to satisfy the congestion problems in the Toronto area.

6. PROJECT DESCRIPTION

6.1 Proposed Facilities

The extent, magnitude, capacity and location of the existing and required facilities for passengers, cargo, aircraft, and related activities should be detailed, including:

- the airspace system around the airport;
- the terminal-area navigation aids;
- the runway alignments;
- the runway separations;
- the runway lengths;
- the feasible runway operational scenarios in different wind and visibility conditions;
- the system of taxiways;
- the apron and gate system;
- the terminal buildings;
- the cargo facilities; and,
- the internal ground transportation system within the airport boundaries.

Related support services should be explained, including:

- municipal services (water, hydro, sewage disposal, garbage, fire protection, policing, emergency services);
- communications systems;
- protection systems for electro-magnetic interference;
- waste management facilities;
- automobile parking;
- fuel storage and distribution;
- aircraft maintenance facilities;
- aircraft parking and hanger facilities; and,
- airline operations facilities (e.g., food, dispatch, training).

The proposed construction and renovation activities should be described, giving timetables for starting and finishing each phase, and outlining the methods and procedures to be followed. The construction phases can be categorized as pre-construction, construction and rehabilitation of disturbed areas. The effects on air services during the construction period.

In order to ensure that the proposed project is 'workable', each of its constituent elements should be examined in consultation with representative users and stakeholders (e.g., community groups, industry, Canadian Airline Pilots Association and the Canadian Air Traffic Control Association). A suggested stakeholder consultation method is described in the letter to Transport Canada attached to these Guidelines.

6.2 Airport Usage

All future operational activities at LBPIA should be described and compared. These activities may include items such as runway use, aircraft movements, aircraft mix, training activities, flight patterns and night operations. Describe operating policies which will govern these activities.

To support the information provided in this section, Transport Canada should provide information that describes the future (with and without the proposed runways) situations.

Similarly, the future development of air traffic at LBPIA, as measured in terms of passengers, cargo and aircraft movements, should be described. Scheduled airline, charter, cargo and general aviation movements should be reported separately. Data presented for future air traffic at LBPIA should include:

- the expected distribution of flight arrivals and departures throughout the day;

- the expected distribution of flight arrivals and departures throughout the week;
- the nature of the shifts in these expected distributions that occur during peak travel periods; and
- the expected distribution of runway utilization for arrivals and departures by month.

6.3 Airport Access

A comparative analysis of the present congestion of airport access routes and how future LBPIA growth will affect this congestion, together with proposed solutions, is required (see Section 8.4).

6.4 Cost

General cost estimates for the proposed project, including design, construction and operational costs should be detailed in the EIS, and should be compared with general cost estimates for each of the alternatives. Each cost estimate should include all monitoring, mitigation and compensation costs. The potential for cost recoveries by Transport Canada through operational charges should be described.

7. ENVIRONMENTAL IMPACTS

7.1 Noise

The purpose of the noise portion of the EIS is to provide detailed information concerning the changes to the noise environment affecting areas surrounding LBPIA that would result from the addition of runways. It is intended that the noise impact information be presented in a manner which is understandable and useful to both the public and technical readers. Both medium- and long- term noise impacts must be considered.

This issue is recognised as one of the most significant public concerns associated with not only the addition of runways at LBPIA, but with the existing operations at the airport. Accordingly, a baseline noise profile that is representative of current operations should be established for comparative purposes, and the noise effects of additional runways, additional flights, alternative arrival and departure flight routes, different aircraft mixes and modifications to flight scheduling should be identified and assessed.

Suitable models or other techniques that can incorporate ambient noise conditions, a range of aircraft operations, ramp and maintenance activities and ground-level effects should be selected or developed to provide reasonable estimates of noise contours associated with the full range of potential airport operations and weather conditions.

Noise effects must be considered not only at LBPIA, but also at other airports for those alternatives that involve diversion of operations from LBPIA.

To place this issue in proper perspective, it is clear that LBPIA, like most other major international airports, has now, and will continue to have, an aeronautical noise problem. However, the relative incremental effects and the net effects of the proposed project on the future aeronautical noise regime at LBPIA are clearly of interest to both the Panel and the affected public. Thus the noise analysis provided in the EIS should provide sufficient detail for comparative evaluation of the social and environmental impacts of three conditions:

1. the airport and present runway system with present levels of aircraft activity (eg. 1996 and 2001);

2. the airport and present runway system with projected future levels of aircraft activity (eg., 1996 and 2001); and

3. the airport and proposed runway system with projected future levels of aircraft activity.

A noise analysis should be undertaken to demonstrate noise levels, on an hourly, daily and annual basis as well as at peak levels and for durations of various intensities. The information developed must provide for the assessment of both the noise effects of the operation of individual aircraft as well as the cumulative effects of the operation of many aircraft over periods of hours and days. The analysis shall provide sufficient detail for a comparative evaluation between the existing baseline situation and the situation predicted to occur with additional runways in place.

The noise levels should be described, using an acceptable energy-averaging methodology, so that any interested party can determine the change in level to be expected at any particular location. If necessary to describe different effects, such as the impact of flight frequency or the time of day of aircraft operations, more than one measurement scale should be used.

In particular, noise impacts of individual flights should be expressed in steps of 5 dBA, starting at the ambient background level appropriate to the type of land use and the time of day. The implications of each step in terms of quality of life, both

indoors and outdoors, enjoyment of property, sleep disruption, health, as well as land use planning and community services such as schools and hospitals should be described. The implications for the natural environment should also be described.

Typical peak and long-term noise levels for each proposed arrival and departure flight pattern should be described and assessed. Noise generated during each stage of flight operation should be considered, including turning manoeuvres, overflight on final approach, landing deceleration, the application of reverse thrust, taxiing, take-off roll and climb-out. The effects of expected changes in the aircraft fleet operating at LBPIA should be considered in this assessment. Predictive information for each alternative should be related to and supported by the actual baseline measurements taken in the vicinity of LBPIA (and at other airports, if necessary) for existing operations.

Noise from all ground-based activity associated with the airport should be considered, including maintenance, engine start-up and run-up, increased motor vehicle traffic and commercial operations. The analysis should include the effects of various meterological conditions, including wind direction and strength, cloud cover and relative humidity. The effects of night operations, those between 2300h and 0700h, should be both identified separately and included in the overall noise profile.

The proposal should be structured to include physical and operational measures to reduce and mitigate the impact of noise on communities in the vicinity of the airport, and the contributions of each of these measures shall be individually evaluated in the EIS. Specifically, Transport Canada should indicate the measures that would be required to ensure that noise exposure remains at or below commonly accepted upper limits of acceptability established for residential areas.

Where the analysis indicates a residual noise impact after the appropriate physical and operational measures have been taken to reduce and mitigate noise levels, practical methods for coping with and/or compensating for this residual impact should be recommended and evaluated as part of the proposal.

All assumptions used in the analysis, including runway utilization patterns, aircraft mixes, air traffic control operating procedures, hours of airport operation and mitigation measures shall be documented.

7.2 Air Quality

The EIS prepared for the medium-term proposal should fully examine the potential impacts of the additional air traffic upon air quality in the vicinity of LBPIA.

The assessment should address air quality, both on-site and off-site. The ambient concentrations of conventional and hazardous pollutants should be projected and air quality impacts assessed for the full range of flight operations and weather conditions at the airport. Ground level ozone is of particular note because of the elevated levels already recorded in the Toronto area.

The air quality analysis should describe quantitatively the existing ambient conditions and the expected changes in air quality. NO_x, trace volatile organics, ozone and particulates should be determined based on an air monitoring programme (particulates and NO_x) established in the communities immediately surrounding LBPIA and on calculations of other pollutants emitted based on fuel composition and consumption.

The analysis should include not only individual considerations of air and ground-based activity under varying meteorological conditions, but the cumulative effects of these activities due to the close proximity of LBPIA to industrial land uses and major highway systems.

The assessment should also address physical indicators such as visibility and odour, and, in consultation with health authorities, should review the potential human health implications of projected ambient conditions.

The effects of any changes in air quality, including odour, or any precipitant particulates from aircraft operations on the area near LBPIA should be described, with reference to both the human and biological communities. The expected future air quality should be related to federal Ambient Air Quality Objectives, as well as to relevant provincial, regional, and local objectives or standards.

There should be an assessment of the difference in overall engine emissions in the airport area between the current fleet and level of aircraft operations and the fleet and level of aircraft operations that is expected at LBPIA in the future under the proposal and each of the alternatives.

Comparison should be made between the overall fossil fuel usage by aircraft to move a given passenger and cargo volume over representative routes as compared with usage by other transportation modes, such as rail, bus and truck to move the same volume.

The air quality component of the EIS should also include an analysis of the emissions generated by ground service vehicles used in airport terminal and maintenance areas, and the impact on these of additional runways and flight operations. These emissions

should be compared to emissions that arise out of the operation of private cars and buses, both now and in the future, to and from the airport. The emission standards that apply to each type of vehicle should be described.

7.3 Water and Soil Quality

The existing hydrology of the airport should be described, and expected changes resulting from the new runways should be assessed. Impacts relating to surface run-off should be described, and its effects on drainage in the surrounding area.

Existing baseline conditions in both Etobicoke and Mimico Creeks should be established, together with an estimate of the current contribution of LBPIA to the pollution of these watercourses. Total Phosphorus, suspended solids and dissolved oxygen should be measured, as well as glycol during the de-icing season.

Site construction activities and final site landscaping should be assessed to determine possible negative impacts upon these watercourses. Different engineering options should be examined to protect the ecological integrity of the creeks and appropriate sediment management plans developed.

Once constructed, additional run-off from new runways and flight service areas together with changes in overall site grading may place an additional loading on Etobicoke and Mimico Creeks. The additional flows and stormwater contaminants from runways and aircraft service areas should be studied to determine the effects on receiving water quality.

Transport Canada should undertake an analysis of the effects on local soil conditions, watercourses and municipal sewer systems of the run-off of used and spilled glycol aircraft de-icing fluid, urea runway de-icing agents, aviation fuels and ground service vehicle fuels and lubricants. Expected future conditions should be compared to existing ambient conditions, and mitigation techniques to trap, treat, re-cycle and/or dispose of released pollutants and reduce undesirable effects should be described as part of the proposal.

7.4 Waste Management

The waste management problem at LBPIA encompasses the reduction, recycling, handling, treatment and disposal of three types of wastes:

- domestic and international wastes from aircraft flights;

- wastes generated within the airport by passengers and employees during the course of their normal activities; and,

- wastes arising from the containment of spills and catchment of solid and liquid pollutants, including de-icing agents and petroleum products.

The EIS should describe the methods currently used at LBPIA to manage each of these three types of wastes, including the volumes of each that are generated. Steps now being taken to institute a full waste management system at or near LBPIA should be documented, and additional requirements that would arise as a result of the addition of the proposed runways should be described. Any release of airborne or other pollutants that may arise out of the handling and treatment of wastes should be described, as well as the methods proposed to ensure compliance with relevant federal, provincial and local standards.

In examining waste management issues, the proponent might also take the opportunity to obtain recommendations from experts as to how current waste management practices at the airport might be improved consistent with new objectives for waste reduction.

Transport Canada should include an assessment of the potential for fuel spills and other releases of hazardous materials as a result of additional flights scheduled for LBPIA. Methods of containing such spills and restoring affected areas should be described.

7.5 Natural Environment

The provision of additional runway facilities at LBPIA would require significant alteration to the present open areas at LBPIA, and may require major in-filling of or structural additions to the ravine lands bordering Etobicoke Creek. The significance of these areas as wildlife habitat, including the creek's potential for fish habitat, should be examined as part of the assessment of the impacts associated with alternative runway options at LBPIA.

The magnitude, probability and, most importantly, the significance of impacts of the proposed runways on the natural environment (e.g., soil, vegetation, animals, birds and natural habitats) should be described.

Similarly, increases in bird strikes and impacts upon wildlife caused by additional taxiing and flight operations, new flight paths, night lighting, noise and habitat removal should be addressed at LBPIA. The study should also address the effects of both new runway alignments and surrounding land uses, existing and proposed, on the risk of bird strikes. Mitigative measures to reduce this potential safety hazard should be addressed.

7.6 Historical Environment

Portions of the 1,729 hectare LBPIA site were used for non-aviation uses for many years prior to the purchase of the lands by the federal government. It is important that an understanding of those prior uses be developed, in order that the EIS can include an assessment of whether artifacts of historical importance may be lost, destroyed or rendered inaccessible as a result of the addition of runways at LBPIA.

In particular, the ability to provide for continued public access to the cemetery located on the 5th line should be evaluated. Applicable provincial legislation must be considered with respect to the future of this cemetery.

8. SOCIO-ECONOMIC IMPACTS

8.1 Social Impacts

The positive and negative social impacts likely to result from the construction of additional runways and from future plans to accommodate the increased demand for air services in Southern Ontario should be assessed. This assessment should include:

- an evaluation of the impact of noise, traffic and air quality changes resulting from construction and operation of additional runways on the quality of life in neighbouring residential communities;
- an assessment of the social implications on neighbouring communities of any project impacts on the physical and biological environments;
- a descriptive analysis of the major regional government planning policies related to population growth, land use, recreation, and transportation, and an analysis of the extent to which municipal and provincial plans and policies might have to be modified or changed as a result of the project;
- a review of the burden on municipal services (e.g., water, sewage disposal, garbage, fire protection, emergency measures) which may in turn affect the quality of services to the local community; and,
- an assessment of any electro-magnetic interference which may disrupt communication systems such as television, radio and police communications.

The effects of increased air traffic levels, various aircraft mixes, a range of air traffic control procedures, aircraft operational practices and ambient meterological conditions shall all be considered in this evaluation.

8.2 Health Impacts

The EIS should establish the specific health impacts that may be expected to arise from the project on:

- the residents of communities that surround the airport;
- employees of businesses located near the airport; and,
- employees who work on the LBPIA site.

This analysis should include the effects of the required construction programme, the levels of air traffic expected on each runway following the addition of the proposed runways, and any additional ground traffic that would be expected in conjunction with the operation of the proposed runways.

The nature and incidence of potential adverse health impacts should be described. The EIS should also identify any sectors of the population that may be at particular risk from the anticipated health effects of the project, and methods of reducing health impacts to all sectors should be described.

8.3 Schools and Institutions

A separate study should be conducted to assess the noise impacts on schools and institutions (e.g., hospitals, seniors' residences) in the communities surrounding the airport. A survey should be undertaken to determine the current baseline level of aircraft noise inside schools and other institutions, and how it affects the teaching process (i.e., number of times teaching has to stop completely because of noise).

In addition, Transport Canada should undertake a qualitative study on the disruption of normal activities, such as speech interference, distractions, interruption of concentration, interference with quiet activities, recreation and relaxation, and whether extra-curricular school activities are adversely affected. Establishing a consultation programme to rotate active runways in order to minimize impacts when outdoor school activities are more prevalent should be considered as a mitigative measure, if necessary.

The study of effects on schools and institutions should take into account the following variables:

- runway utilization (including effects of weather);
- number of landings and take-offs as a function of time of day;
- flight patterns;
- aircraft altitudes; and,
- types of aircraft.

Future sound levels impinging on schools and institutions should be compared to existing baseline levels, and should be detailed and presented in terms of:

- the sound emission characteristics of the anticipated aircraft;
- the magnitude of the sound level created at school sites by aircraft operations and the duration and timing of such levels; and,
- the frequency of various sound level occurrences during total operating hours of the school facilities.

To properly assess indoor noise impacts based on outdoor noise levels, the sound isolation performance of the school buildings must be studied. Of importance will be whether the schools are affected by actual vibration.

Possible changes in flight patterns should be examined to attempt to avoid schools and institutions that have not been properly sound-proofed. Such buildings should be identified so that future noise impacts can be assessed and noise mitigation alternatives considered.

Transport Canada should select schools for study based on their existing and anticipated noise levels. In particular, at least one school that is now affected by noise, one that is not now affected but will be if the proposed runways are added, and one that is outside current and future noise footprints should be studied.

8.4 Ground Access Systems

Any significant increases in flights at LBPIA, such as may occur with additional runways, can be expected to result in increased demands on the intra-airport and surrounding ground access systems.

Similarly, any new introduction or expansion of air operations at other regional airports could have similar effects. While it must be recognized that the provision and operation of ground access facilities beyond airport boundaries is outside Transport Canada's jurisdiction, it is important that the impacts of airport activities on these facilities be known.

The EIS must include a statement of the LBPIA access policies and strategies proposed by Transport Canada, and the facilities to be provided within the airport property for parking employees' and passengers' private cars, for dropping off and picking up passengers by private automobile, for cargo delivery pick-up and transferring, and for taxis, public and private buses, parking lot and hotel shuttle vehicles, rental cars, inter-terminal and intra-airport employee and passenger transportation systems, and systems in place for the receipt and transportation of operational supplies around the airport. The EIS should also include a description of the airport access (e.g., roads, rapid transit) and access support systems (e.g., off-site parking) expected to be supplied by others.

The capacity of on-site access facilities must be shown to be consistent with the passenger and cargo volumes expected and capable of being handled by the terminal, runway and airspace systems, and with the expected methods of access to and egress from LBPIA. Moreover, the EIS should evaluate the ability of the off-site public and private transportation facilities to serve the demands expected to be generated directly and indirectly by the airport. If increased economic activity on the lands near the LBPIA is expected to result from the addition of runways, then the traffic demands generated by this activity must be included in the assessment.

The EIS must describe the existing and predicted surface traffic movements in terms of volume, frequency and directional distribution in the areas that might be affected by the addition of runways. In particular, the EIS should include an evaluation of whether the ground access facilities currently in place and planned near LBPIA (and other regional airports in those instances where flights are to be diverted) are of sufficient capacity to accommodate both their currently predicted users and those additional users that would arise out of increased airport activity. The impact on the level of service predicted for these facilities must be evaluated and considered.

The need for and impacts of providing necessary major linkages, including roads, expressways, transit and rail connections and their associated facilities, between LBPIA and other regional airports, or between LBPIA and the municipal or provincial road and/or transit infrastructure must be considered. Similarly, the

impacts on ground access at LBPIA and at other regional airports of alternatives to the project must be considered. The adequacy of the ground access systems at LBPIA should be assessed in light of the potential adverse impacts on traffic congestion.

If it is determined that a significant impact, such as increased traffic congestion, would result from the proposal, then mitigative measures must be proposed and evaluated.

8.5 Economic Impacts

The positive and negative economic impacts and the overall economic implications for Toronto, Southern Ontario, the rest of Ontario and Canada likely to result from the construction of additional runways at LBPIA, as compared to pursuing other alternatives, should be analyzed. The impacts studied should include the effects on:

- land accessibility and values for various use categories (e.g., commercial, residential, industrial, agricultural) and any changes which may result from the project;
- expected changes in temporary and permanent employment (airport-related and other);
- local and regional economic activity, business revenues and available services;
- business travellers;
- tourists and pleasure travellers;
- cargo shippers and carriers and the potential for and economic implications of supply disruptions or shortages;
- the air transport industry, including both capital and operating costs;
- costs to airport users that arise out of delays resulting from the construction of the two additional runways;
- fuel consumption, by both aircraft and ground vehicles;
- the potential loss of business to airports in the U.S.;
- current and future employment in the tourism and convention sectors;
- changes in municipal and provincial tax bases and revenues;

- the potential for congestion at LBPIA to affect investment and expansion decisions of businesses currently located in Toronto; and,

- the degree to which congestion at LBPIA is projected to affect the transportation and warehousing decisions of businesses currently located in the communities around the airport.

The ability to provide service, and the effect of congestion and variable airport capacity limitations on its reliability should be considered.

8.6 Regional "Spoke" Communities

It is important to review and assess Transport Canada's proposal in province-wide terms. LBPIA is vital to the social and economic infrastructure of many communities that rely on LBPIA as a "hub" airport.

The impact of an expanded LBPIA on these regional stakeholders should be measured in comparison with the other alternatives in terms of:

- the penalties and inconvenience of congestion on people and freight travelling to and from these communities;

- the ability of companies in these communities to maintain their current businesses and markets as well as to expand and grow; and,

- the impact of delays and congestion on the potential for new investment and new jobs in these communities.

9. MONITORING

The EIS should describe the noise, air quality, water and other monitoring programmes that have been developed, or will be put in place, to establish the baseline conditions that currently exist in the vicinity of LBPIA.

Plans for monitoring the project effects should be described. This should include a discussion of the proposed mechanisms and scope of the monitoring programme. In addition, the EIS should describe the manner in which on-going monitoring programmes will continue to be used, in the event the project proceeds, to determine whether anticipated conditions are being achieved and whether mitigation measures are successful or must be modified.

Environmental monitoring programmes are required to establish:

- existing baseline environmental conditions;
- the effects of construction activities;
- the effectiveness of mitigative measures; and,
- the operational impacts of new facilities and controls.

Monitoring locations must not be limited to Transport Canada property, but should also be established at representative off-site locations to address environmental changes in adjacent neighbourhoods.

Programmes should be established to monitor:

- aircraft noise;
- ambient air quality (including particulates, nitrogen oxides, and ozone);
- stream water quality; and,
- local drainage and stormwater quality.

The results of these monitoring programmes should be made available to the public on an on-going basis.

10. MITIGATION AND COMPENSATION MEASURES

This section of the EIS should describe methods to mitigate the environmental and socio-economic impacts described in Sections 7 and 8, and any residual impacts remaining after the application of mitigating measures. Mitigation measures should be discussed in terms of effectiveness, practicality, financial feasibility and enforceability.

The EIS should indicate the types of compensation that may be provided to those adversely impacted by effects of the proposal that cannot be mitigated.

The cost of all assumed or proposed mitigation and compensation measures for the project and each of the alternatives must be reported in the EIS.

11. SAFETY

Any changes in the safety level associated with air transportation that may result from increased concentrations of air traffic at LBPIA or in the airspace surrounding LBPIA as a result of the proposal, or the alternatives, should be assessed. This should

include an assessment of the changes in potential exposures and safety levels that may occur at other airports as a result of the proposed project or its alternatives.

The safety level associated with the proposed full runway and taxiway system should be reviewed, including any effects that result from taxiing aircraft traffic, land gradients adjacent to runways and low horizontal visibility conditions at LBPIA.

Contingency plans for responding to any emergency situations which may occur in the vicinity of the additional runways, both during and after the construction process should be discussed.

12. PUBLIC CONSULTATION PROGRAMME

In addition to the public participation activity to be conducted by the Panel, and in order to complete certain information requirements of the previous sections, the proponent will have to conduct a public consultation programme. The programme should be described in the report.

This programme description should include:

- a list of the groups, agencies and individuals contacted;
- the opportunities provided for the public to obtain information and the methods and extent to which they were advertised; and,
- the degree of public response.

Documents received by Transport Canada from groups, agencies and individuals during the preparation of the EIS should be available for public examination.

13. APPENDICES

The Appendices to the Environmental Impact Statement should include:

a) a glossary of all technical and scientific terms used which may not be readily understandable by the public;

b) lists of references cited and literature used but not cited;

c) a list with the addresses of all consultants and government agencies associated with these studies and related evaluations along with the names of the individuals involved; and,

d) copies of reports developed from studies associated with the development and preparation of the EIS; and,

e) copies of documents received by Transport Canada from interested groups, agencies and individuals during preparation of the EIS.